BOSTON MECHANIC,

AND

Journal of the Useful Arts and Sciences.

JULY, 1835.

HOW TO BUILD PULPITS.

Taste ought ever to be guided by a sense of appropriateness, and a regard to convenience and actual utility. In nothing is this maxim of more importance than in the construction and fitting up of houses and other buildings, both public and private. A disregard of it, in the attempt to beautify, has not unfrequently rendered quite useless the objects upon which the skill of the artist has been exercised.

Our public buildings, especially our churches, where, above all places, the purest taste ought to be apparent, have been tortured into every shape. Pulpits have been placed, now up to the ceiling, now *under the gallery;* in short, every contrivance that ingenuity, unaided by propriety, could suggest, has been followed out in their construction. The Religious Magazine, the very work that ought to have done it, has given an article explaining how pulpits ought to be built, which we have no hesitation in introducing into our work, with the accompanying engraving of a pulpit built for a religious society in Shrewsbury, illustrating the writer's ideas of propriety in this branch of architecture. The public taste can only be improved, by the continual placing of pure and classical models before it, that it may admire them, and imbibe the spirit in which they were designed. We think it peculiarly appropriate to a 'Mechanics' Magazine,' to aid in this work, and the subject before us being particularly deserving of interest, from its having a bearing on some of the most interesting and important associations of the moral affections, we are glad to insert the following remarks:

It is reported that Daniel Webster once made the remark, that if you were to box up a lawyer, in a pulpit, as you do a minister, he never would gain his cause. Whether he be actually entitled to the credit of this very sensible remark, we cannot tell, but of this we are confident, that if he ever

said anything upon the subject, he ought to have said precisely what we have recorded. It would be about as well to preach from the *steeples* of some of our churches, as from their *pulpits*. But time and the march of modern improvement are fast tearing down these huge edifices, from whose giddy height our unfortunate predecessors were compelled to shout down, upon the upturned heads of the congregation below.

Every one knows that most ministers speak with more interest and effect in the crowded conference room, than in the church. Why is it, but because, in the former situation, the speaker is in the midst of his audience, he is surrounded by them, his sympathies are awakened, and he is excited by a glow and a fervor of feeling, which he in vain endeavors to attain, when in the isolation of his lofty eminence in the church?

We are led to these remarks by having recently seen a pulpit in the congregational church in Shrewsbury, Mass. It is a beautiful pier table, placed upon a platform a little elevated above the congregation. It more perfectly corresponds with our idea of what a pulpit should be, than anything else we ever have seen. There is an air of ease and elegance and freedom about it, which we never before have seen attained, in the most costly specimens of pulpit architecture. The accompanying plate will give an idea of its appearance. The platform upon which the table is placed is 4 feet high, about 10 feet long, and 6 feet deep. The table itself is of beautiful mahogany, ornamented with rich carvings. The face of the table is of a gentle slope, and its pressed velvet cushion is pleasing, both to the eye and the touch. The height of the table, without the cushion, is 3 feet; its length 4 feet 6 inches; its breadth 2 feet 4 inches. At the inside of the table, where the speaker stands, there is a gentle curve which is not represented by the plate. The accompanying drapery is simple and tasteful. In the evening it is lighted by a suspended lamp. There is a shelf under the face of the table, for the Bible and Hymn-book.

The cost of this beautiful pulpit was but sixty dollars, exclusive of the sofa. The society in Shrewsbury must be one of more than ordinary intelligence, thus to break away from long established custom, and to adopt a plan so peculiarly marked with utility and taste. We are persuaded that few building committees, after seeing this pulpit, would persist in the prevailing practice of boxing up the minister.

MECHANICS AMONG ANIMALS.

[Furnished for the Boston Mechanic.]

Some of the animals are mechanics, and very curious ones, too. Some of the mechanical arts are supposed to have been learned of them. The birds too, are builders, and the bees also. We think a history of some of these mechanics by instinct would be highly interesting, and shall endeavor to procure some accounts of the most curious of them to present to the readers of the Mechanic. Studies in Natural History, especially of the living portion of the creation, not only interest and instruct, but exert a moral influence upon every heart. The attention of the young, particularly, should be directed to these things. By referring them to their own instinctive love of life, they must be taught not to trifle with that love in the lower orders; and not to kill them, or even in the least injure them, unless necessity requires it; and by admiring and being delighted at their wonderful ingenuity, they will be taught not to wish to destroy their nests and habitations.

ANTS AND ANTS' HOUSES.

Every one knows something about the beaver; and some of us have seen their dams and habitations, constructed with all the skill of the scientific mason and mill-wright, so far as teeth and claws can be made to suffice for axes and hands. But the beaver is by no means the most wonderful builder in the brute creation. There are even insects, which build larger houses for themselves than the beaver does, and of nothing but clay, too. This is a kind of ant. When we examine the ant hills we commonly see, we do not observe anything very surprising, but the instinct and industry of the laborers in the little subterraneous republic. But were we to discover an ant hill as large as one of our own houses, we should have rather greater reason for wondering at the immense labor which it must have cost such a tribe of creatures.

The white ants of Africa, sometimes called termites, build houses of this description. They are ten or twelve feet high, and so firm that cattle run over them without breaking through. No structures have ever been built by man, skilful as he is, of a size in this proportion to his own dimensions. Probably, a building eight hundred feet high would be no more, in proportion to the size of man, than these houses are

to the ants. The strength of insects is much greater than that of man and animals, in proportion to their size. Some insects are able to jump twenty or a hundred times their own length, which no animal on earth can do. Ants carry loads much larger than their own bodies, in their mouths.

The white ants are a most voracious race, and so mischievous as to inspire us more with dislike than their buildings do with curiosity and wonder. Their food is wood, and they eat all of this they can find. They gnaw up inside of the timbers of a house, and eat out all the inside, leaving nothing but a shell, and plastering the avenues they have made with clay. They will eat out the solidity of whole houses, and even the furniture, and leave them, to all appearance, as sound as before; but if the walls are handled rudely, they will crumble down at once. They also eat up all the dead trees in the forests, and in this way they do some good along with their mischief, by clearing out from the forests all decaying rubbish.

These houses are built, as has been remarked, of clay or earth, filled with rooms, chambers and galleries, throughout. They also dig roads under ground, (for all their works are done in secret,) in all directions from their houses, to every place where there is any plunder to be obtained. In the centre of the great house is a large nursery room, where all the young ants are reared. This being in the centre, is in the most secure place. A part of the ants are regular soldiers, and they keep guard at all the avenues leading into their habitation; and if a man ventures to meddle with them, or to break down their walls, they sally out upon him, and make him glad to retreat as quick as he can. The working part of the community never attempt to fight. Like the bees, they have one female or queen, who is kept in the above mentioned nursery room, and carefully guarded by a band of soldiers.

Incombustible Cloth.—Asbestos and amianthus are two minerals which are composed of fibres fine and flexible enough to be woven into cloth, at least with a small addition of cotton, &c. Our surprise at their resisting fire ceases when we reflect that they are of a stony nature. But the most wonderful property is that of resisting heat; so that fire dresses have been made of them, in which a person could walk securely through flame, the asbestos gauze warding off the heat.

IMPORTANT USES OF SLATE.

Slate is rather an abundant material, and great as is the use now made of it, it seems as though its full value had not yet been discovered. It is contemplated to use slabs of slate, fixed in a bed of concrete, as a substitute for granite sleepers on the London and Birmingham Railway. Some experiments have been made, from which it resulted that slate, of a certain thickness, will answer all the purposes of granite, for railroad sleepers, at less than half the expense of that material. It was found, by the hydraulic press, that a cubic inch of slate will sustain a pressure of three tons and a half, and consequently, that slate of an inch and a half thick, is more than sufficient under any pressure which it may be required to support on the railroad.

Slate has also been used for the flooring of warehouses in London; and it has also been laid down in the strand, as foot pavement, in order to prove, by experiment, its durability compared with Yorkshire flag-stone.

The comparative ease with which slate can be worked, will render the adoption of it in cases like the above, an important application, in places where it can be abundantly procured. From its lamellar texture, it is peculiarly adapted to the purposes of flooring, and it may be used to advantage in the construction of fire-proof buildings.

SUMMER DIRECTIONS TO MECHANICS.

The following directions, from the Peoples' Magazine, are of the first importance. They regard that most important of subjects, the health, and are peculiarly applicable to those who labor hard in warm weather, as is the case with most mechanics. Excessive eating, with which the writer begins, is a proverbial fault among us.

Eat sparingly of food, especially of animal food. It is a great mistake of those who labor excessively, that they must eat more in proportion. The hunger which is felt, in such cases, is a diseased hunger, not a natural one. Those who are inactive in body or mind, or over active in either, should alike eat but little. It is he whose body and mind are exercised moderately, and in due proportion to each other, who can eat and drink freely.

Do not eat, at any rate, while greatly fatigued in body or mind; and above all, do not take spirits or bitters, or vinegar,

or mustard, or pepper, or ginger, or anything of the kind, with a view to *create* an appetite, which is, after all, artificial. The laws of God, established within you, demand rest, in such cases, rather than food or drink. But if you drink at all, let it be small draughts of cool, but not *too* cold water. Avoid ice.

In lying down for repose during the hot season, avoid currents of air, and the damp ground. Many of those laborers who are troubled with rheumatism in old age, ought not to wonder what caused it, unless they have very poor memories.

July is an appropriate season for cold bathing. This is a subject of immense importance. We regret that we cannot enlarge upon this topic here.*

In July, you should retire at dark, and rise at dawn; or at least, before sunrise.

THE BAMBOO.

[Furnished for the Boston Mechanic.]

The bamboo is a native of the hottest regions of Asia. It is likewise to be found in America, but not in that abundance in which it flourishes in the old world. It is not brought into this country for many useful purposes, being rather an object of curiosity than of utility. But in the countries of its production, it is one of the most universally useful plants. 'There are about fifty varieties,' says Mr. Loudon, in his Botanical Dictionary, 'of the *Arundo bambos*, each of the most rapid growth, rising from fifty to eighty feet the first year, and the second, perfecting its timber in hardness and elasticity. It grows in stools which are cut every two years. The quantity of timber furnished by an acre of bamboos is immense. Its uses are almost without end. In building, it forms almost entire houses for the lower orders, and enters both into the construction and furniture of those of the higher class. Bridges, boats, masts, rigging, agricultural and other implements, and machinery, carts, baskets, ropes, nets, sail-cloth, caps, pitchers, troughs, pipes for conveying water,

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* We may insert something hereafter on the subject of bathing in our work. Perhaps it cannot be of greater importance to any class, than the laboring portion of the community.—Eds. Mec.

pumps, fences for gardens and fields, &c., are made of it. Macerated in water, it forms paper; the leaves are generally put round the tea sent to Europe; the thick inspissated juice is a favorite medicine. It is said to resist acids, and, by fusion with alkali, to form a transparent, permanent glass.

CURING SMOKY CHIMNEYS.

Fig. 1.

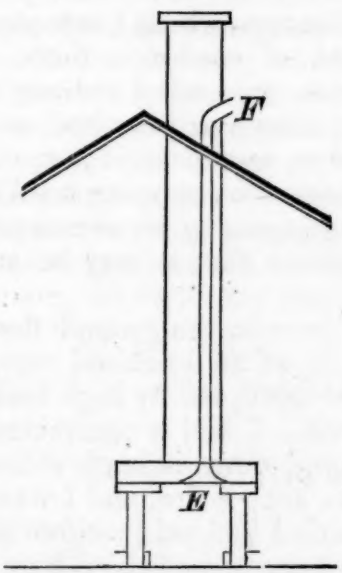
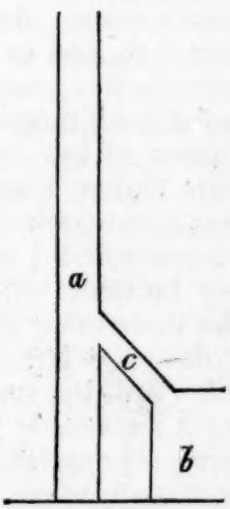


Fig. 2.



As a smoky chimney is a serious inconvenience, any method of remedying the disorder is acceptable. Various plans have been devised for the purpose, some of which succeed often, but few or none always.

The difficulty is always a defect in the draft; a fire refusing to burn well, or to send up regularly its column of smoke, &c., unless a free supply of pure air constantly flows in upon it. Hence the expediency of the frequent practise of opening a door or window, which does not, however, do so much towards letting out the smoke, (as some suppose,) as towards driving it up the chimney. Unless a supply of fresh air can be obtained from some other source, it will either be drawn from the room itself, which cannot always be done, from the tightness of the room, or else a current of air will be drawn down chimney, and with it, the ascending smoke will be

returned into the room. This seems to be the general cause, but there are many varying circumstances, such as the blowing of the wind out of doors, which sometimes hinders the exit of the smoke, and the peculiar shape of the chimney and fireplace, in which, it is to be feared, the directions of of the ingenious Count Rumford are most generally quite neglected. The following may be added to the number of remedies for the inconvenience of which we are speaking, as one promising to be quite as useful as any of them.

To the Editor of the N. Y. Mechanics' Magazine.

'An article in a late number of your journal recalls to my mind a plan of curing smoky chimneys, which I saw practised in Paris when I was a student of medicine there, about twenty years since. As this plan succeeded entirely in the case referred to, and as it is not known or practised, so far as I can learn, in this country, and as, moreover, it is applicable to the worst conditions of chimneys, for carrying smoke well, I mean those of low buildings, adjoining or surrounded by such as are higher, I am of opinion that it may be adopted with great advantage.

'The room which I occupied was on the ground floor of a two story building, on one side of an enclosed square, of which the three other sides were occupied by high buildings. The fireplace was large and open. I had it contracted *a la Rumford*. Still the smoke poured down in such volumes as to render it impossible for me to keep a fire, and I was about abandoning my quarters, for which I had paid a three months' advance of rent, when, at the suggestion of the porter, I sent for a chimney doctor. He brought with him two pails full of plaster of Paris, a hammer, and a cylinder of wood about eighteen inches long, and two or three inches in diameter. I say cylinder; it was, more strictly speaking, a truncated cone, the diameter of one end being a little smaller than the other.

'The doctor went up the chimney, and with his hammer made a hole through one side of the chimney, just above the roof. This hole was about large enough for a man's arm to enter. Now, placing the stick or cylinder, which he had greased, inside of the chimney, from opposite to the hole downwards, he called for some timbered plaster, and formed around the cylinder a pipe opening downwards. By successive formations, he continued this pipe down to the lower part of the chimney breast, where it terminated with a flattened opening. This he called a ventouse or blower. The

operation of this contrivance, for which a tin or copper leader might be substituted, will be evident to any one acquainted with the subject.'

MEDICUS.

A current of air descends through this pipe, sufficient to supply the fire with a constant draft, and thus obviates the difficulties usually causing chimneys to smoke.

In the cut, fig. 1, FE represents the blower, the upper part of which enters the open air, above the roof of the building, and the lower part enters at the top of the fireplace.

As in close connection with the above article, we insert from the London Mechanics' Magazine, a plan for building chimneys which shall need no sweeping. It is represented in fig. 2:—*a* is the chimney, which is continued straight without interruption to the ground, whilst the fireplace, *b*, is placed in front of it, and communicates with it laterally by a short flue, *c*. The flue alone will require sweeping, says the Magazine, for 'as the stream of hot air from the fireplace comes in contact with the cold air in the chimney, the particles of soot are detached, and precipitated to the bottom of the chimney, whence they may be removed by a door.'

USE OF HEATED AIR IN FURNACES.

THE interesting Reports on this subject which have appeared in the Franklin Journal having closed, we take the liberty of extracting some particulars additional to those we gave in No. 3, of this volume.

QUALITY OF THE IRON.—Notwithstanding a prejudice entertained to the contrary, the reporter considers that the iron produced by the hot air furnaces is equal in quality to other iron. He cites instances where this iron is employed with success for almost every purpose where iron of a good quality alone is suitable, as in mill-work, steam-boilers, and engine machinery, suspension bridges, &c.; and adds, in conclusion, 'these different examples prove, that by means of the hot blast plan, as well as by the old mode, superior metal can be made for foundry purposes, and which is well adapted for conversion into wrought iron.'

INCREASE OF HEAT.—It has been remarked, several times, in the course of the reports, that the temperature of the furnaces worked with hot air, appears to be higher than in those

where combustion is sustained by the use of cold air. All the indications which are usually considered as guides for the working of the furnace, unite in proving this assertion.

The scoriæ becomes perfectly fluid, and do not attach themselves to the tuyeres, (or wind-pipes;) the quantity of flux necessary to reduce the metal is lessened, the increase of heat causing it to fuse more readily; and certain coals are employed crude, which it was deemed necessary to convert into coke, on the former method of working. Another singular circumstance is, that in many cases, less air is required; an engine, for example, formerly supplying three furnaces with blast, is now sufficient for four.

Apparatus.—The apparatus for heating the air consists of a series of small pipes, through which the air passes, from the bellows to the furnace. This is heated sometimes by a separate fire, and sometimes as in cupola furnaces, by the furnace fire.

EFFECTS OF MACHINERY.

It has been calculated that two hundred arms, with machines, now manufacture as much cotton as twenty millions of arms were able to manufacture without machines forty years ago; and that the cotton now manufactured in the course of one year, in Great Britain, would require, without machines, sixteen millions of workmen with simple wheels. It is calculated farther, that the quantity of manufactures of all sorts produced by British workmen with the aid of machines is so great, that it would require, without the assistance of machinery, the labor of four hundred millions of workmen.

In the wool manufacture, machines possess an eminent advantage over common wheels. The yarn on thirty or thirty-six spindles is all equally twisted and drawn to the same degree of fineness. The most dexterous spinners cannot twist so equally and so gently twenty slips of yarn from wool of the same quality, as a machine can do twenty thousand.

At one of the cotton mills in Manchester, yarn has been spun so fine, as to require 350 hanks to weigh one pound avoirdupois. The perimeter of the common reel being one yard and a half, 80 threads or revolutions would measure 120 yards; and one hank seven times as much, or 840 yards, which multiplied by 350 gives 294,000 yards, or 167 miles and a fraction.

WHAT IS THE USE OF LEARNING?

[By one of the Editors.]

When the Indian was asked whether he would have his son learn to read and write, he replied, 'What will be the use of my son's learning to play with a feather?' Now who blames the savage for his indifference to this most useful art of civilized life?

When we recommend learning to many whom we believe to stand in need of it, we expect they will ask, like the Indian, 'Of what use will it be?' We cannot expect those who are ignorant of any branch of knowledge to understand intuitively the value and advantages of its acquirement. We have, we believe, in part, answered this question, in one or two former articles; but there is some room yet left, we apprehend, for further illustration.

Knowledge is certainly necessary for every mechanic, in regard to his own trade—and simple as that may be, there is little room for its being so simple that nothing remains to be learned concerning it. Without much knowledge, especially without much scientific knowledge, indeed, one may go on plodding in the way of his fathers, as the Chinese continue to do, or like the farmer who carried his grain to mill in one bag, and put stones in another to balance it on his horse; but one cannot so expect to be able to work to the best advantage, to make the most of expedients, or to avail himself of easier ways of operation, which a little more knowledge and a little more thought would often discover.

For many of the mechanical professions, such as those of the carpenter, the architect, the worker in metals, the painter, much knowledge is necessary to a perfect acquaintance with their arts, which ought not to be carried on without an intimate knowledge of scientific principles, especially geometry, chemistry and natural philosophy. Without books, they will assuredly, after a while, of necessity discover some of these principles, just in time to perceive that had they learned them long ago they might be much farther advanced in their trade.

Probably every one, in the course of his profession, has often met with cases, for which no rule had been found laid down, and obstacles which no previous experience had taught him how to surmount; and perhaps, for the want of knowledge sufficient to invent new ways of operation, and to discover in what the unexpected difficulties lay, he has lost

his time, his labor and his materials, and perhaps spoilt his tools, in trying to do what science, if he had known anything about it, would have told him he could not do.

Had the German miners, who prayed to be delivered from cobalt, been better chemists, they might have discovered the value of that material in the arts. Had the ignorant voyagers who loaded a fleet with yellow sand, in hopes of realizing a golden treasure, been chemists, they might have been spared the vexation of so much labor in vain.

The following illustration of the value of scientific knowledge, is extracted from a work entitled *Mechanique appliquée aux Arts*.

'Brandies have, according to their greater or less degree of concentration, a greater or less specific gravity. The French, who first measured these degrees of concentration by hydrometers, were by this means enabled to make their brandies always with certainty of the precise degree of strength or *proof*, required by the markets to which they were carried. The Spaniards, whose strong full-bodied wines are eminently suited to distillation, endeavored to enter into competition with them, but as they were not acquainted with the use of the hydrometer in determining the specific gravity of their spirits, they were obliged to content themselves with the following clumsy and awkward substitute:—A drop of oil was let fall from a given height on the surface of the brandy, and as it sunk to a greater or less depth, the liquor was concluded to be more or less concentrated. This *measure* failed them perpetually, and the result was, that no dependence could be placed on the strength of their brandies. Spanish brandies having thus acquired a bad reputation in the market, were purchased by French merchants, concentrated to the requisite degree of strength as indicated by the hydrometer, and ultimately sold as French. By the sale of this description of brandy in the northern market alone, the French, before the revolution, realized an annual profit of four millions of francs. The Spaniards now understand the use of the hydrometer, and carry their brandies to market themselves.' *

In so far as a person is ignorant, just so much more is he liable to be imposed upon. Designing men like to take advantage of ignorance, especially where the deception is

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* The suggestion may be made, that if the consumers of this article understood, and would follow their own best interests, they would dispense with the use of both French and Spanish brandies.

unlikely to be discovered. The peasant cooper who discovered the quicksilver mines at Idria, received but a trifling compensation for the quantity which he carried to an apothecary, who took care to conceal from him its real value. Not long since, a piece of land was bought for a moderate consideration, in some one of the New England states, by some persons who had learned enough of mineralogy to discover a valuable quarry upon the ground, which the owner knew nothing about.

But, it may be said, it is not likely that a mechanic would often make such discoveries, or realize a fortune through some accidental discovery which he might make in science. Perhaps not. Had we believed that the pecuniary advantages, the advantages in trade and business, were the *only* ones to be derived from learning, we might even have said less upon the subject than we have said. We are not among those, if such there be, who believe that nothing is useful to a person, but what promotes the increase of his property.

The ignorant man, who has nothing but hands, is but a tool, a machine, much like a steam-engine, or a saw-mill. He can work, to be sure, and earn money, but he may not know how to keep it, or if he can keep it, he is ignorant of the means of truly enjoying it, and making the best use of it.

But there is this advantage in the possession of knowledge of a useful and practical character—that besides making him a thinking, rational, social, useful being, it also enables man to take the best advantages which his trade affords, and even to turn into the channel of his trade, resources which no one else would have thought of making useful.

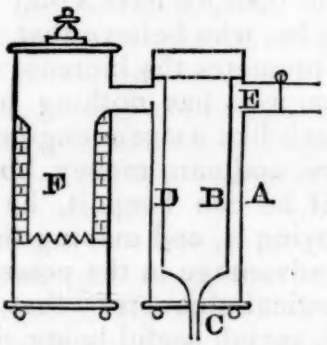
One need only to turn to the lives of men of mechanical genius, to see how, by taking advantage of little things, and facts which no one had observed, or which every one had thought unworthy of regard, they have established new and important principles in the arts, and built up for themselves manufactories for the practice of their newly discovered processes. Instead of envying them, and repining at our own ignorance, and our own incapacity of rising above the level of mere instruments of labor, would it not be more rational to do the best we can to elevate our minds, and increase the limits of our knowledge?

We have often thought that the want of scientific knowledge among laborers, in the mechanic arts, is a grand reason why they are not more independent, and able to command better wages. If they are ignorant of the principles of their employment, so as to be unable to conduct, direct and make

improvements in their business, they can but expect to remain more or less in subjection to those who possess this knowledge, and who may, and undoubtedly do, often keep to themselves important practical secrets, of which others cannot avail themselves, and without which their endeavors at competition must be fruitless.

AMERICAN PATENTS.

[Abridged from the Journal of the Franklin Institute.]



PATENT *for a Stove for Burning Anthracite;* Denison Olmsted, New Haven, Connecticut, November 6.

The patentee prefers to have his stove constructed of sheet or cast iron, lined with fire brick or lute; but the part for which the patent is actually claimed is the *Radiator*, an appendage constructed of two hollow concentric cylinders, the space between the two being divided into two chambers by partitions, so that the heated air from the stove passes down one side, and up the other. The central cylinder is open at the bottom and top, by which a draught of air is to pass, and be heated by the hot current passing between it and the outer cylinder.

The patentee employs stoves with one or two radiators. The cut represents a stove with one radiator. A, the outer cylinder of the radiator; B, the inner cylinder; C, an opening by which air may enter the inner cylinder; D, space between the two cylinders, vertical partitions in which compel the draft to descend on the side next the stove, and to ascend on the opposite side, to pass off by the smoke-pipe, E; F, stove of the ordinary construction.

PATENT *for Water Proof Umbrellas;* Edwin L. Simpson, Roxbury, Norfolk county, Massachusetts, November 19.

Silk or other material is to be coated with India rubber in the usual manner. The segments to form the seams are not to be sewn together, but cemented by means of dissolved caoutchouc. The ends of the junctures are to be attached to the ribs of the frame by sewing; but at other places, small pieces of India rubber cloth are to be cemented to the cover, across the ribs.

PATENT *for an improvement in Axles and Boxes for Railroad Cars;* Dexter C. Force, and Frederick Davis, Baltimore, November 5.

The axle is to be turned and made true in the usual way, and upon it is to be placed a metal ferule or tube, fitting it exactly. The wear is to be upon the ferule, and the box containing it in the hub of the wheel, so that no wear takes place on the axle.

PATENT *for a Threshing and Winnowing Machine;* William Leighton, Portsmouth, Rockingham county, New Hampshire, November 17.

There is to be a revolving, conical body, with a horizontal axis, and channelled from end to end, so as to form upon it twelve or any other convenient number of angular teeth. It may be three feet long, eighteen inches in diameter at one end, and ten at the other. A semi-circular concave, adapted to it, and similarly grooved, occupies one half of its circumference, extending round from the top to the bottom. The driving apparatus is at the large end. The sheaves are to be threshed by letting the ears be drawn in between the cone and concave, the straw being still held in the hand; whereby the corn will be entirely separated from the husk.

PATENT *for an improvement in Screw Augers;* Raymond French, Derby, New Haven county, Connecticut, November 11.

This improvement consists in giving to the plates which are to be twisted, a longitudinal concave surface, so that the plate, as well as the pod, when twisted, shall be thinner at the centre than at the edges, either by a regular curvature, by a diminution of thickness formed by straight lines, or by lines in part curved and in part strait.

By this arrangement, it is said, greater strength is attained in the disposition of the metal, and more capacity is given to the spiral cavities of the pod, permitting a freer exit to the chips. A coarser screw than usual may also be given to this instrument.

PATENT *for Moulds for Bending Scythe Sneaths;* Silas Simson, Sterling, Worcester county, Massachusetts, November 25.

The patent is for metallic, instead of wooden moulds for the above purpose, to remedy the difficulty caused by the cracking and warping of the wooden ones, under the heat to which it is necessary to subject them.

COLORS OF THE ANCIENTS.

[Compiled for the Boston Mechanic.]

EVERYTHING relating to old times is interesting. When we read of the cunning work, the fine linen, and other works of art among the Jews, in their first days, we can but wish that we could behold some specimens of the arts, as they were practised three thousand years ago. We can hardly be expected to be gratified with such a sight; but the catacombs and temples of Egypt, present works which were completed, many of them, and their builders dead, thousands of years ago.

To some it is familiarly known that the ancients possessed the means of painting in so durable colors, that paintings which have been discovered, even at this present time, are as bright and fresh as though newly painted. It is supposed that they possessed certain arts altogether unknown to the moderns, particularly a method of painting indelibly on glass. When Sir Humphrey Davy was at Rome, in 1815, he undertook experiments upon the nature of the ancient colors, which were attended with interesting and satisfactory results. The following are some of them, taken from an abstract of a paper read by him before the Royal Society.

Of the red colors, he distinguished four distinct kinds, viz: one bright and approaching to orange, which he found to be *minium*, or the red oxyde of lead; a second, dull red, which he ascertained to be an iron ochre; a third, a purplish red, which was likewise an ochre, but of a different tint; and a fourth, a brighter red than the first, which was *vermilion cinnabar*, or a sulphuret of mercury. In the fresco paintings in the Baths of Titus, he found that all the three first colors had been used, the ochres particularly, in the shades of the figures, and the minium in the ornaments on the borders.

Of the yellows, the more inferior were mixtures of ochre and different quantities of chalk; the richer varieties were ochres mixed with the red oxyde of lead. The ancients had also two other colors, which were orange or yellow; the *auripigmentum* or *arsenikon*, said to approach to gold in brilliancy of tint, and which is described by Vitruvius as being found native in Pontus, and which Davy says was evidently sulphuret of arsenic—and a pale sandarach, said by Pliny to have been found in gold and silver mines, and which was imitated at Rome by a partial calcination of cerusse.

The differently shaded blues, by the action of acids, uniformly assumed the same tint; from which he concluded that the effect of the base was varied by different proportions of chalk. This base he ascertained to be a *frit*, made by means of soda and sand, and colored by oxyde of copper.

The greens were, in general, combinations of copper; and it seemed probable, that although they appeared in the state of carbonate, they might originally have been laid on in that of acetate. The purple of the ancients was regarded as their most beautiful color, and was obtained from shell fish. Vitruvius states that it was prepared by beating the fish with instruments of iron, freeing the purple liquor from the shell containing it, and then mixing it with a little honey. Pliny says that, for the use of the painters, *argentine creta*, (probably a clay used for polishing silver,) was dyed with it, and both Vitruvius and Pliny state that it was adulterated, or imitations of it made by tinging *creta* with madder; whence it would appear, that the ancients were acquainted with the art of making a lake color from that plant, similar to the one used by modern painters.

The blacks and browns were mixtures of carbonaceous matter, with the ores of iron or manganese. The black from the baths of Titus, as well as that from some ruins near the Porta del Popolo, presented all the character of carbon.

Pliny speaks of ivory black invented by Apelles; of a natural fossil black; and of a black prepared from an earth of the color of sulphur. Davy is of opinion, that both these latter pigments were ores of iron and manganese; and he observes that the analysis of some purple glass satisfied him that the ancients were well acquainted with the ores of manganese.

The azure, says Davy, of which the excellence is sufficiently proved by its duration for 1700 years, may be easily and cheaply imitated; he found, for instance, that fifteen parts of carbonate of soda, twenty parts of opaque flint pow-

dered, and three parts of copper filings, by weight, when strongly heated together for two hours, yielded a compound substance of exactly the same tint, and of nearly the same degree of fusibility; and which, when powdered, produced a fine deep sky blue.

QUICK TANNING.

Patents of late, have been taken in this country, for methods of expediting the process of tanning, whereby an operation of several months was to be perfected in as many hours. The quickest way is not always the best way. It seems that in this instance, this is likely to prove the state of the case. A writer in an English Magazine makes the following comments:

'I have just read, in your last number, that a Mr. G. Burr, of New York, has recently taken out a patent for the expeditious tanning of hides, which he promises, through the medium of forcible action, to be afforded him by the vigorous powers of a fulling mill, to be able to bring into a finished state of manufacture in a few hours; while under the old system, it would have taken, according to the calculation of experienced tanners, a period of ten or twelve months to convert a stout ox-hide into a thoroughly tanned article.

'I cannot see how our brother across the Atlantic, by the new and rapid process of tanning which he has announced, will be able to bring his experiments to a sound and profitable issue, as by urging a too quick incorporation of the animal and vegetable juices, (which he must do, according to the method he has explained,) he will be compelled to force out a great proportion of the former, *i. e.* the vitality of the hide, which ought to be preserved as much as possible, to confer weight and firmness on the manufactured article.

'Plans have been brought forward in this country, as well as America, for expediting the process of tanning, but I have never heard of much success attending any of them. By applying a moderately stimulating warmth to the article while in the pit, the process may, no doubt, be a good deal accelerated; but all aid from such noxious articles as vitriol, &c., ought to be reprobated, and even prohibited by Act of Parliament.'

ECONOMY.

[Furnished for the Boston Mechanic.]

If time is money, so is economy. As economy is none too much in the fashion in these days, we wish rather to bring it into notice among our patrons, the mechanics. We are afraid, however, that the thing has been so much talked about that it has got to be an old story, and that people are tired of hearing about it, as they are of hearing the same truths from the pulpit every Sabbath; but as the lessons of the one are no more practised than those of the other, it seems quite as necessary as it ever was before to say, on the authority of Dr. Franklin, that it is the road on which those who would thrive *must* travel. And since some things are better described by showing what they are not, we shall endeavor to show what, in a few instances, is not economy.

1. It is not economical to be idle, at any time. Every hour of the day is silver to the working-man; and if he would loiter about for one hour, without either doing or *learning* anything useful, he might with as much reason take a quarter of a dollar out of his pocket, and throw it into the dock.

2. It is not economical to buy or to hire a larger or handsomer house than one can pay for. Some folks, who ought to be plain mechanics, not contented with that, must needs put on a little of the fashionable. A mechanic not only can, but ought to be a gentleman; but he will be more of one, by sticking to his trade, than by trying to place himself above his trade.

3. It is far from economical to turn day into night, and night into day. This is one of the most prevailing fashionable sins of the age, though not to so great an extent here as in the old country, where Dr. Franklin, whom we have already mentioned, proved most clearly, that the practice alluded to is very expensive, in an essay which we advise every one to read, who thinks the sun does not shine till he has been risen three or four hours.

4. It is not economical to be so prejudiced in favor of old customs, as to reject every improvement, however valuable, that threatens to drive one out of the 'good old way' of doing things.

5. Some people seem to prefer to go to work the hardest way, to do whatever they set about. Others spend all their strength in the first few strokes, and have none left for by and

by, when the heat of the day comes on. This is not economy. Slow and sure—steady—is the word, with him who does most—ay, and best, too. There is economy in labor, as well as in time and money. There is a piece of economy, (we forget where we first came across it,) which we can but think of every time we see a poor hard-working mason, carrying his hod-full of bricks up a high ladder. The simple contrivance of a rope across a pulley, would enable him to raise, by his own weight in descending, a much heavier load of bricks than he can carry up—in less time, and with no waste of strength, which is always great where the workmen has to lift his own body together with his load, up an almost perpendicular ascent.

6. We have not time to say everything; but we would say, finally, it is not economy 'to put off till to-morrow what can be done to-day.' Yet many will do it; and why? Because they are a little to indolent to have all their work done; they are afraid there will be hardly enough to do to-morrow.

NOTES FOR JULY.

INDESTRUCTIBLE VARNISH.—Mr. John Oxford has shown that naptha, or the essential oil of coal-tar, purified and saturated with chlorine, is converted into a fixed oil, of a clear, red color, which becomes as thick as jelly in cold weather. One part of oil, two parts of white lead, one of purified lime, and one of coal-tar ground together, form a paint which will resist all the agents by which the substance to which it is applied are liable to be attacked, and also preserves wood from worms.—MANUEL DU TOURNEUR.

MELTING IRON.—M. Le Clerc, the proprietor of an iron manufactory near St. Etienne, France, is reported to have discovered a method of melting soft iron, (fer doux,) which has hitherto been considered as infusible.

TO REMOVE INK SPOTS FROM DRESSES.—Soak the article in milk before washing it.

PREVENTION OF MOULD.—Says M. Dutrochet, in the Edinburgh Philosophical Journal, 'I dissolved a drop of the most liquid portion of the albumen (white) of a new laid egg, in an ounce of water, and put it into a flask. This liquid was preserved for a whole year, exposed to the light, and put into the dark; but it never exhibited the least trace of mould. Mercury, whether in the state of salt or oxyde, completely obstructs the appearance of mould.'——'Might not this principle, remarks another English Magazine, be taken advantage of in preserving water on board ships? Albumen is not only harmless, but nutritive, and eggs are very cheap.'

SUBSTITUTE FOR INDIAN INK.—Boil parchment slips, or cuttings of glove leather, in water, till they form a size, which, when cold, becomes of the consistence of jelly. Then, having blackened an earthen plate, by holding it over the flame of a candle, mix up the fine lamp black thus obtained with some of the above size, while the plate is warm. This black requires no grinding, and produces an ink of the very same color, which works as freely with the pencil, and is as perfectly transparent as the best Indian ink.—LON. MEC. MAG.

FINE ENGRAVING.—Mr. Charles Tappan, of Philadelphia, has engraved the whole of the Lord's prayer on one tenth of a square inch—a space less than one fifteenth the average size of a sixpenny piece. The whole Bible printed in a character equally minute, would only cover a space of seventeen inches square.—BOSTON PAPER.

One can hardly believe this, but if we look at certain steel or copper line engravings, we shall find it absolutely impossible to count the lines with the naked eye, or even to see one distinct from the other. The very attempt makes the eyes ache.

STEEL PENS, when first introduced, cost seventy shillings a gross; the same quantity are now manufactured for four shillings. About 120 tons of steel are annually used in this manufacture, each ton producing 1,900,000 pens.—LON. MEC. MAG.

CORK STOPPLES.—Cork is the thick bark of a species of oak, which grows abundantly in Spain. The Egyptians are said to have made coffins of cork. It was not used for stopples till about the close of the seventeenth century, or little over two hundred years ago.

Drawing on Cloth.—A new method of drawing on cloth, has been invented by an Englishman possessing great superiority over every other method heretofore devised. The cloth is first prepared by rubbing into it an adhesive composition, which unites the threads, and makes it as easy to draw upon as paper. After the drawing is made, the cloth is covered with a transparent varnish. It might be supposed that cloth thus treated would be stiff and liable to crack, but on the contrary, it admits of being folded with the greatest ease, and without injury.—Lon. Mec. Mag.

Where does Camphor come from?—It is distilled from the roots and branches of a species of *Laurus*. There are also trees in which camphor is found concreted in the clefts of the bark. Laurus is the name of a race of trees, which contains also the cinnamon, and the sassafras.

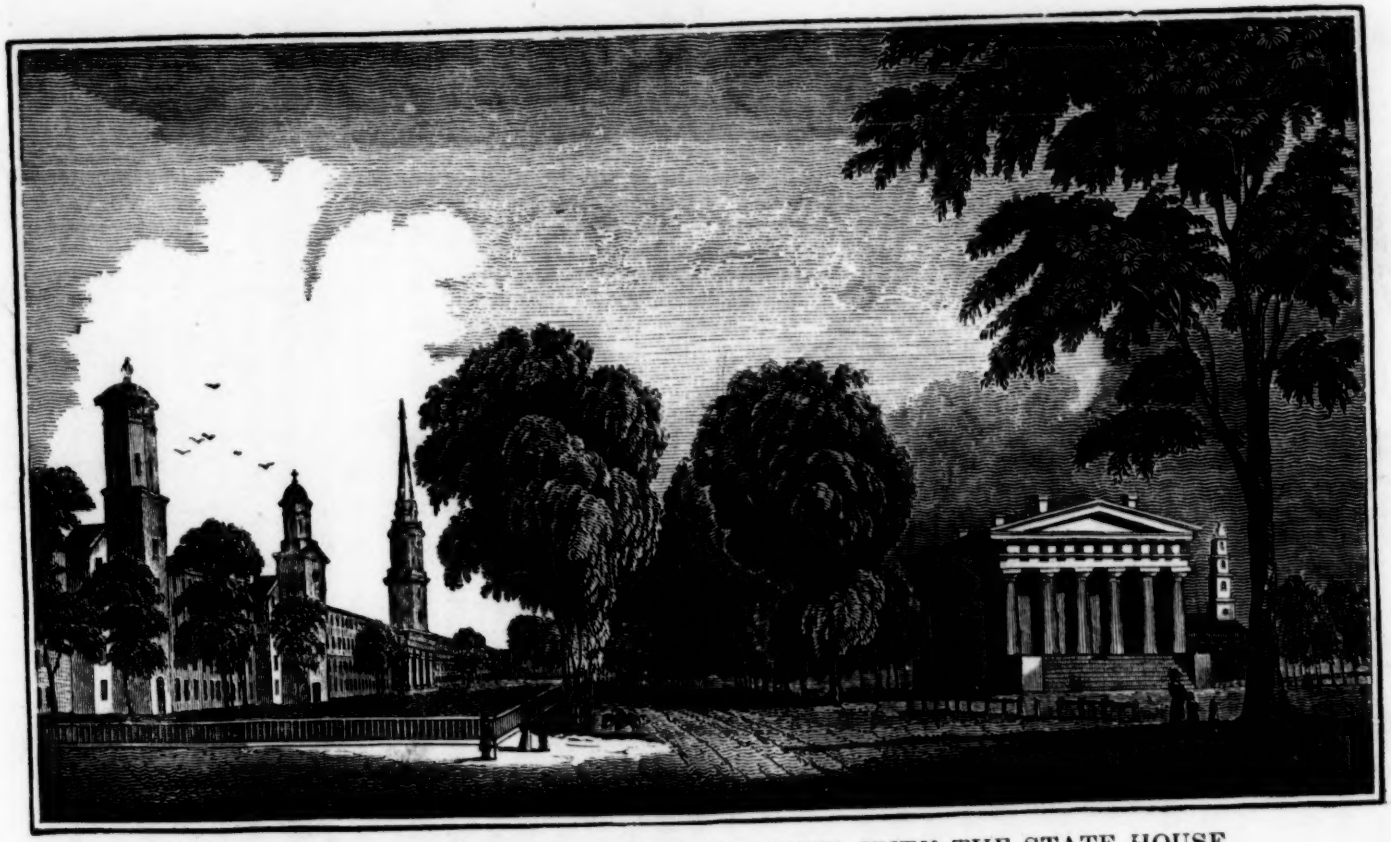
Improvement in Fire Tongs.—To prevent coals falling from the tongs, four small sharp spikes of well tempered steel, may be riveted into each lip of the tongs, projecting about one quarter of an inch. So says a correspondent of the New York Mechanics' Magazine. We should think it a good plan.

To prevent Colored Cloths from Fading.—We have heard of late, and those who told us, had tried it, and found it successful, that fading colors might be set by soaking the cloths in salt and water. Since then, we have also seen the receipt in print.

Use of Horse Chesnuts.—In Turkey, they are ground, and mixed with the provender for horses. After being boiled, to remove the bitterness, bruised, and mixed with a small quantity of barley meal, they are good food for poultry.

Hints to Correspodents.—Since we began this volume, we have received a number of communications, for which we are obliged to our correspondents. They are respectfully requested to continue their favors. We are especially desirous of receiving practical communications, from practical men, which shall bear the stamp of experience, and recommend themselves to the common sense of plain and practical readers.

One or two questions, our mathematical friends are reminded, remain unanswered and uncommented upon.



YALE COLLEGE, NEW HAVEN, CONNECTICUT, WITH THE STATE HOUSE.